Occasional Paper No. 1 - May 2001

An Overview of Health Impact Assessment

This is the first occasional paper published by the Northern and Yorkshire Public Health Observatory. We intend to publish papers which we hope will be of general interest and help to those working to improve health in the Northern and Yorkshire Region.

We welcome comments on this paper and also on topics that you think we should address. Our contact details can be found on the last page.

Introduction

It is widely accepted that a range of factors determines the health of a population and that the greatest scope for improving the public's health lies outside the control of the NHS. There is also a great deal of evidence that adverse factors affect groups in society who are more socially and physically vulnerable, such as people living in poverty, people from ethnic minorities, elderly people and women, to a much greater degree than other sections of the population.

Health impact assessment (HIA) has been developed to identify those activities and policies likely to have major impacts on the health of a population in order to reduce the harmful effects on health and to increase the beneficial effects.

Health impact assessment is a multidisciplinary process within which a range of evidence about the health effects of a proposal is considered in a structured framework. It takes into account the opinions and expectations of those who may be affected by a proposed policy. Potential health impacts of a proposal are analysed and used to influence the decision-making process. A health impact assessment is based on a broad model of health, which proposes that economic, political, social, psychological, and environmental factors determine population health.

This report has been produced at a time when there is considerable interest in HIA in the region. The purpose of the report is to review what has been done so far and how the two new organisations in the region - the Public Health Observatory (PHO) and the Health Development Agency (HDA) - might contribute to this.

What is Health Impact Assessment?

The definition published in the Gothenburg Consensus Paper[1] by the WHO Regional Office for Europe is:

ISBN: 1-903945-03-8

"A combination of procedures or methods by which a policy, program or project may be judged as to the effects it may have on the health of a population."

Health impact assessment utilises both qualitative and quantitative measures to consider effects of actions ranging from government policies to local projects on the health of a defined population. The aim is to reduce the ill effects on health of planned actions, and to increase the health benefits. It is a process to assess the effects of a wide range of activities from national government policy to a local neighbourhood project on the health or the determinants of health of a defined group of people. The introduction of health impact assessment is based on the recognition that many of the determinants of health are included within public policy, such as housing, town planning, education, transport, working conditions, income, relative income, and employment status. These have a major effect on both physical and mental health, and can be compounded, as an accumulation of disadvantage over a life course.

The process of health impact assessment grew out of environmental impact assessment carried out on projects in developing countries, and has been developed at national and regional levels in Australia, Canada and New Zealand. Ideally HIA should be integrated with environmental impact assessment (EIA) and social impact assessment (SIA) as much as possible, while at the same time ensuring that the importance of human health is not lost in the integration process. Furthermore, the HIA should be commissioned as early in the project planning cycle as possible, when alternative options are being discussed. This will allow a comparative assessment to be made of the health impacts of each option and importantly, it will allow time for baseline data to be collected.

Why is it important?

Health impact assessment has been hailed as one of the most important new processes in public health. There are mutual benefits for both potential protestors and industry/protagonists. Although this may be overstating the significance of a yet unevaluated process, its future development seems to be assured by the commitment of government to the principle of health assessment of public policy. Health impact assessment (HIA) is currently the focus of considerable UK and international interest, due to the increasing attention being given to HIA within the European Union. It is the intention of the UK Government to apply HIA to relevant areas of public policy as a mainstream part of the decision making process at both national and local levels.

Apart from the commitment to examine its own major new policies, the Government[2] has stated that:

"Local decision-makers must think about the effect which their policies may have on health, and in particular how they can reduce health inequality. In most cases this will require a change in the way that health authorities, local authorities and other local agencies see their role. They will in future need to act much more as health champions at local level and ensure health is on the agenda of all local organisations and agencies outside the health field. An important part of their role will be to encourage all local agencies to make local health impact assessments when planning investment in, for example, amenities, buildings or local communities and in the location of services."

Para. 4.47[2]

In addition the Coronary Heart Disease National Service Framework states that:

"Public agencies are encouraged to estimate and report publicly on the likely impact of their major decisions on the cardiac health of the local population, including inequalities."

The European Union and many countries, including the United Kingdom, have a legal requirement to carry out environmental impact assessment. Article 129 of the Maastricht treaty requires the Commission to:

"Check that proposals for policies, and implementing measures and instruments, do not have an adverse effect on health, or create conditions which undermine the promotion of health [and] Health Protection requirements shall form a constituent part of the Community's other policies."

Article 152 of the later Amsterdam Treaty includes the subparagraph:

> *"A high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities."*

Procedures for health impact assessment could be introduced with the inclusion of health in existing processes for environmental assessment[3]. Some initial findings from the HDA review of experience in Europe suggests that the most advanced practitioners do integrate HIA into existing structures for EIA. However the situation in Canada (which is described on page 4) suggests it is far from easy, and requires deep political commitment to resource the implications. There is also the fear of litigation which may seriously impede planning procedures overall, and which is a potential negative impact of HIA.

Constraints at a local level

At a local level, there may be constraints to the introduction and use of HIA; these may include:

- Limited resources (money, personnel, time, facilities);
- An already overcrowded agenda for public sector agencies that fulfil statutory duties as a first priority;
- In some areas and for some sectors, a tradition of minimal public or community participation;
- Competing interests - within organisations, between partners, between certain sectors, and between the political parties operating in different jurisdictions;
- Lack of expertise or skills in HIA;
- A growing number of HIA toolkits which need critical review to provide an evaluated model;
- Lack or absence of evidence concerning the impacts on health of various policy actions.

Benefits of HIA

There are also many benefits to the use of HIA, these may include:

- Can be used prospectively, concurrently or retrospectively;
- Values a social model of health and well-being;
- Aims for equity;
- Uses a multidisciplinary and participative approach;
- Works towards sustainable development;
- Makes use of qualitative and quantitative best available evidence;
- Encourages openness and transparency to public scrutiny;
- Demonstrates health gain as an added value;
- Responds to public concern about health;
- Provides an opportunity to develop effective partnerships.

History in UK

The first documented health impact assessment in the United Kingdom was undertaken as a submission to the public inquiry on the proposed second runway at Manchester airport[4]. It used a prospective method based on environmental impact assessment. The study was limited by a lack of quantitative data but still proved to be a powerful lobbying tool. It resulted in the implementation of changes to the planning proposals, including increased provision of public transport and noise reduction schemes.

Liverpool Public Health Observatory has published several health impact assessments undertaken in the Merseyside area:

- Community safety projects in the Huyton SRB area[5];
- The Southport Drug Prevention Initiative[6];
- The King George V playing fields in the Huyton SRB area[7];
- The International Astronomy and Space Exploration Centre[8];

- Twelve Quays, Wirral and the Merseyside integrated transport strategy[9].

At a more local level, there is a Health Impact Assessment programme at the University of Northumbria at Newcastle. It has completed health impact assessments on the second Tyne Tunnel (the biggest HIA in the UK to date), a proposed Farmer's Market, the Prison Service Family Ties Policy, and the re-development of community facilities on a deprived housing estate. The assessments are due to be published shortly.

What resources/toolkits are available?

The British Columbia model

The "Canadian Handbook on Health Impact Assessment"[10] has been produced to assist health professionals in providing health advice to cover the breadth of methods and disciplines involved in health assessment and is available at www.hc-sc.gc.ca/oeha. The tool was designed to analyse the health impacts of public non-health policy. The tool consists of eleven questions about key factors that affect health; each question has a health enhancement bias. They are based on social, economic and physical determinants of health, and cover, for example, life-long learning, social networking, and the environment. The tools are to be employed in the development and planning of action programmes, and to act as guidelines for decision-makers. This was simplified to five key areas: social integration; employment and economy; education and skills; environment and safety; and programmes and services. Further development of this has been slowed by changes in political priorities.

The Swedish County Councils model

This model[11] was developed as part of the Public Health Program and is designed to appraise the health impacts of non-health policies in support of daily decision-making by politicians. The particular focus of this model is assessing the impacts on those suffering health inequalities in the affected population. A key question asked is:

> *"How is the health of different groups affected by the proposed policy decision in question?"*

The Bielefeld model of environmental health impact assessment

Workers at the University of Bielefeld[12], in co-operation with those at the Institute of Public Health for North Rhine-Westphalia, developed the concept of environmental health impact assessment in order to improve the coverage of human health in the process of environmental impact assessment. This model is designed for the evaluation of projects of different types, and can be applied in various local situations. The emphasis is on the impact of changes in the physical environment. There are three components as key elements of the model:

- Analysis of the status quo;
- Prediction of impact;
- Assessment of impact.

Tasmania Department of Health and Human Science model

In January 1996[13], Tasmania introduced a formal and explicit requirement for HIA through the Environmental Management and Pollution Control Act. Under this legislation, all proposed developments that require environmental impact assessment must also be the subject of health impact assessment. A basic principle is that HIA is not a separate process but an activity integrated into environmental impact assessment. This simplifies the procedure for developers and government. There is co-operation in the early stages between government and developer to ensure that the final HIA is appropriate. Another feature of HIA is that positive impacts of health are sought as well as negative.

New Zealand Ministry of Health model

This guide[14] focuses mainly on the health component of impact assessment. It provides a framework and guide for those who have responsibilities or an interest in resource management issues that have the potential to impact on the health of communities and individuals.

International development organisations guidelines

Guidelines and training have been developed by some international development organisations including the Asian Development Bank[15] and the World Bank[16]. In developing countries health impact assessment has been developed as a rapid appraisal tool for environmental development projects. The method is based on a more medical model of health and considers health impacts in five main disease categories: communicable disease, non-communicable disease, nutrition, injury, and mental disorder. The likelihood of specific health risks related to the project is considered and risk reduction strategies proposed.

The Merseyside model

The Merseyside health impact assessment programme was commissioned from the Liverpool Public Health Observatory in April 1997[17]. A useful feature of this model is the clear distinction made between the procedures and the methods for HIA. The guidelines were written for those who might commission or carry out HIA in the following sectors:

- Central or local government;
- Health;
- Voluntary;
- Other organisations whose work influences or is influenced by public health.

Issues which have been addressed include Single Regeneration Budget, regeneration, healthy living centres, transport, community safety, youth work, air pollution and housing. A validated tool kit for conducting assessments is still in the process of being developed by the Merseyside Health Impact Assessment Consortium.

The report on the Equity and Health Impact Assessment seminar held in 2000 is available at www.liv.ac.uk/PublicHealth/obs/OBS.htm.

There is also the report of the UK Health Impact Assessment Conference at www.profbriefings.co.uk/events/impact.htm.

Kirklees Metropolitan Council (MC) model

This model was commissioned by Kirklees MC[18] and has two phases.

Phase 1: A transitional model, comprising the core steps, intended for use by practitioners/employees.
Phase 2: The final model to be used as part of a consultative and participative process for HIA.

The British Medical Association (BMA) model of health and environmental impact assessment

The BMA report[19] clearly saw HIA as a part of EIA, stating that HIA should be:

> *"Considered a component of EIA, not a separate and parallel activity. The conclusion is expected to ideally be both qualitative and quantitative."*

It provides a useful overview of the potential advantages of combining HIA and EIA, including methodological principles and a useful series of recommendations which have helped to inform the conclusions to this report.

Which is the best model?

Those looking for an established analytical framework for considering health impacts will be disappointed. Currently there is neither an accepted gold standard nor even a simple, reliable, and evaluated method for carrying out health impact assessment. Only a few assessments have been completed and these used several approaches. HIA is a new and developing field which accounts for the lack of an established framework to date.

Many methodological problems have still to be overcome, including how to measure health impacts and to attain a practical balance between resource costs and depth of analysis. Despite the incomplete nature of the process, many NHS regions and health and local authorities have already adopted health impact assessment. It may be the means to improve attainment of healthy public policy, enhance intersectoral collaboration, and make more appropriate use of finite public resources in evidence based policy making.

The models of HIA from Merseyside, British Columbia, Kirklees Metropolitan Council and Swedish County Councils, are broad in perspective, and those from Bielefeld and the Ministry of Health in New Zealand are tight in perspective. At present, models measure health impacts in different ways.

One of the major criticisms of health impact assessment is that methods of collecting and analysing evidence are not sufficiently rigorous to withstand scrutiny and challenge. The current evidence base for many health determinants is inadequate for accurately informing a process of assessment. In completed studies the principal sources of evidence have come from literature reviews and qualitative methods. A range of data sources including economic, epidemiological, quantitative, and qualitative information should be routinely taken into account. However, often the most useful information is not being routinely collected. Seldom is there going to be the time or money available for collection of primary data. This may limit the strength of the recommendations an assessment can make both in terms of the certainty and size of an impact.

There is currently much debate around rapid HIA which can refer to the whole process and not just the screening stage. It is a brief investigation of the health impacts of a given proposal that is usually achieved within days.

What do the models have in common?

All use some checklist procedure, which uses the perceived determinants of health as markers for changes in health risks - for example, using employment levels as a marker for the status of community health. The difficulty with this is that causal pathways are so complex that it is not often possible to say if an outcome will definitely be good or bad for the health of a population.

A common feature of most is a screening process or rapid appraisal to determine whether or not a full assessment is required. This may be done by one worker or a group of people and usually takes note of available information about the project, programme or policy, information about the demography, social conditions, health status, identification of vulnerable communities within the relevant population, and information about the current environment. An assessment is made of the hazards or effects, their probability, and the capability of organisations to deal with the potential hazards.

If, following this process, a full health impact assessment is required, then 'scoping' to determine the range of issues, population and times may be carried out. A full HIA may be carried out by an 'expert' taking advice from others or by a multidisciplinary team of people.

All the models stress the importance of identifying groups who are most vulnerable in society on the basis that any adverse effects are likely to affect them more severely than others. They are likely to have poorer access to resources, and a lower level of political power to promote their own interests.

Most also stress the importance of involving the local community, both to provide useful information about its structure and vulnerable groups but also to find out more about possible health effects and to work together with the community to devise socially acceptable mitigating effects.

There is currently the problem of lack of hard data with which to assess likely impacts but most processes have used best estimates. It will be important to ensure that what is learned in the process is available for others in the future. In the process of evaluation, or in carrying out a retrospective health impact assessment, problems may be encountered in actually measuring the effects of a programme, and what indicators to use. If using a broad definition of health, then quality of life or health related quality of life might be used. However, this measurement is subjective and different forms will be needed for adults and children, and the amount of necessary research will take up time and resources. There may also be difficulties in attributing a change in indicator result to a particular programme or policy, although this would also apply if using hard clinical data. In evidence based medicine there is a weighted hierarchy of evidence, with randomised controlled trials at the top. Obviously this is not useful in assessments where evidence comes from a range of quantitative and qualitative sources. There is a need to develop a new framework for gathering, interpreting, and prioritising evidence from different origins for evidence based policy-making.

Factors, which may make the process of health impact assessment easier and more effective, include:

- Good joint working;
- Good baseline data about populations;
- A well developed community;
- An overall strategy with shared aims and targets;
- Capacity in terms of time and resources.

It may be the means to improve attainment of healthy public policy, enhance intersectoral collaboration, and make more appropriate use of finite public resources in evidence based policy making.

Publications in the UK

London's health guide to HIA

NHS Executive London[20] has published a short guide to health impact assessment, which recognises that there is no single gold standard but which offers practical help in developing an approach. It has also published HIA resources that provide a descriptive overview of all the models currently available. Both these resources can be accessed via the following websites: http://www.londonshealth.gov.uk or http://www.ohn.gov.uk.

Health Impact Assessment of the City of Edinburgh Council's Urban Transport Strategy

This[21] is an interesting example because it is close to the Swedish County Council's model. It looks at the impact of different transport options on different sections of the population. In order to harness HIA to tackle inequalities in health, this sort of focus is useful.

Developing health impact assessment in Wales

This document[22] aims to increase awareness and understanding of HIA so that national and local organisations adopt it as part of their decision making process. It can be accessed via the website: www.wales.gov.uk/polinfo/health/healthimpact/pdf/healthimp_e.pdf.

Routine data and health impact assessment

This report[23] looks at the role of routine data in different models of HIA, data sources which could potentially be used in HIA, practical issues in using routine data in HIA and methodological issues involved in measuring the health impacts on disadvantaged groups.

Department of Health methodological seminar on HIA

The report[24] of the Department of Health's methodological seminar on health impact assessment is another resource on how to carry it out.

It can be found at www.doh.gov.uk/research/healthimpact.htm.

HIA in the Northern & Yorkshire Region

There are two HIA groups in the Northern & Yorkshire Region in the early stages of development. They are co-ordinated by the Regional Assembly for the North East and Yorkshire Forward. There is considerable interest in HIA across the Region, with a range of activity already underway[25]. This includes:

- County Durham Health Authority has run a workshop on HIA in collaboration with its local authority partners;
- Newcastle & North Tyneside Health Authority is undertaking HIA with other agencies as an integral part of its work in a health action zone;
- Calderdale and Kirklees Health Authority has a joint post for HIA with the local authority (see page 5) and has developed its HIA methods from previous work done by Dr Judith Hooper on health needs assessment;
- Dr Ruth Gelletlie has carried out an HIA on behalf of the West Yorkshire Transport and Health Collaborative Group looking at the health effects of current transport patterns and examining which transport policy interventions might be effective in bringing about a shift to healthier modes of transport;
- Dr Sue Milner at the University of Northumbria is leading a rapidly expanding programme of research and development in health impact assessment (see page 4). Current work includes:
    - Developing two screening tools, one for local government in Tyne and Wear, and the other commissioned by the Department of Health;
    - Health impact assessment on a local bypass;
    - Health impact assessment on a local authority domestic violence strategy;
    - A city-wide regeneration strategy; and
    - An Asylum Seekers Strategy across two local authorities.

What part will the Health Development Agency play?

> *"The (Health Development) Agency's key functions will include maintaining an up-to-date map of the evidence base for public health and health improvement and commissioning such research and evaluation as is necessary to support and strengthen the evidence base in areas where action programmes are required to improve health and tackle inequality, within an agreed framework governed by the Secretary of State's overall research strategy for health."*
>
> *Para 11.6[2]*

The key features of the HDA's role concern mapping the evidence, developing standards and working with partners to develop a strategic approach to implementation. The Health Development Agency is currently adapting the "Short Guide to HIA"[21] produced by the NHS Executive London for national dissemination. This is due in May 2001. They have also commissioned a retrospective process evaluation of a small number of completed HIAs. This will lead into the development of full guidelines during 2001-2002. The former Health Education Authority (HEA) had previously appointed the London School of Economics to undertake a review of HIA experience in the European Union in order to draw together principles, which may assist in the design of UK HIAs. The HDA is exploring the feasibility of developing a "one-stop shop" website for HIA. This will include a database of completed or ongoing HIAs, links to other relevant websites, resources and publications and a discussion forum. There is ongoing work to map the HIA work being undertaken in order to identify gaps and develop a future programme. This includes:

- A meeting to explore the feasibility of establishing a UK based HIA network;

- A workshop for regional players/stakeholders in order to explore the issues associated with taking HIA forward at a regional level and what would be needed to support this.

The HEA had previously published a series of three documents on environment and health, which included road transport[26], housing[27] and air pollution[28]. These reviews are now being updated by the Health Development Agency.

What role will the Public Health Observatory play in HIA?

> *"(One of) the main tasks of the Public Health Observatory in each NHS region of the country.... will be to support local bodies by advising on methods for health and health inequality impact assessments."*
>
> *Para 11.30*[22]

The following are areas where the PHO could discharge its responsibilities:

- In advising and supporting the Secretary of State for Health the PHO could act as a repository of local data/data sets on key determinants of health.
- Nationally Public Health Observatories could formulate a comprehensive checklist of health hazards associated with a series of programmes, policies and projects in each sector to assess health risks in order to guide developers and planning authorities. Hazards both directly and indirectly associated with the development could be included in the checklist. The importance of each hazard should be determined according to its frequency and severity. The checklist should also include sociological factors and perceived hazards for which there is little or no evidence, but high public concern.
- Research could be commissioned on the development of new markers for monitoring and surveillance of health impact such as:
    - Improved estimates of exposure both for individuals and populations;
    - Better methods for extrapolating risk to populations;
    - Development of the ecological basis for risk assessment of exposure to, and effects of, mixtures of chemicals.
    - There is a need for much more epidemiological surveillance both of occupationally exposed groups and of the general population. The PHO could develop underpinning health surveillance with tools to analyse and present findings in new and innovative ways.

What will the HDA and the PHO do jointly?

- The HDA and the PHO will contribute to the national HIA resource/database by collecting data on regional HIA activity in order to evaluate the process and impact of HIA and identify good practice. In doing this, the focus must be on the way the HIA addresses inequalities in health. Information gained would assist the continuing development of HIA methodology, help to define concepts, and provide models for future health impact assessments to follow.
- The PHO and HDA could have a role with other partners around Government Office boundaries in developing an action plan for strengthening HIA in the region and determining how HIA can be used as a tool for measuring the efficiency of regeneration, and to address inequalities in health.
- The PHO and HDA could co-ordinate/promote training at a regional or local level.
- They could also facilitate exchange of experience among practitioners responsible for practical HIA application in the region. This suggestion has been approved by a multi-agency group in the North East, and a first draft audit tool will be piloted.

Glossary

Prospective health impact assessment the potential health impacts of a proposed policy, programme or project are assessed. The aim in assessing potential health impacts is to create an opportunity to change or modify a proposal before implementation in such a way as to maximise the beneficial effects and to minimise any harmful effects on the health of a population, and/or particular population sub-groups. The accuracy of predictions made during a prospective HIA will in part be determined by the strength of the evidence available and assessors' previous experience in similar situations.

Retrospective health impact assessment assesses health impacts that have arisen after the implementation of a policy, programme or project so that future policies are informed, and understanding of the effects of implementing similar policies are increased.

Concurrent health impact assessment the health impacts of a policy, programme or project are assessed during implementation because their nature may not be known or well characterised. This allows the capacity to act promptly to mitigate any negative effects should they arise and to monitor the accuracy of predictions about potential health impacts made prospectively.

Core steps in the process of health impact assessment - screening, scoping, appraisal, decision-making, and monitoring and evaluation.

Policy the way in which government (central or local), a sector or organisation seeks to achieve the objectives it has set.

Programme (or plan) a series of related activities that give effect to policy.

Project a component of a programme - a discrete activity, often at a specific location.

Broad perspective is based on a social model of health and highlights the importance of qualitative evidence.

Tight perspective is derived from environmental impact assessment (EIA) and, in the main, founded on the use of quantitative evidence.

Siobhán Grant
Senior Registrar in Dental Public Health
Northern & Yorkshire Public Health Observatory

John Wilkinson
Director
Northern & Yorkshire Public Health Observatory

Alyson Learmonth
Regional Head of Health Development
Health Development Agency

Contacts

John Wilkinson, Northern & Yorkshire Public Health Observatory
Tel: 01642 385900
Email: PHO.UDSC@durham.ac.uk

Alyson Learmonth, Regional Health Development Agency
Tel: 01642 385907
Email: Alyson.Learmonth@hda-online.org.uk

Lorraine Taylor, Health Development Agency
Tel: 020 7413 1935
Email: Lorraine.Taylor@hda-online.org.uk

Sue Milner, University of Northumbria
Tel: 0191 215 6632
Email: Sue.Milner@unn.ac.uk

IMPACT International HIA Consortium (Joint Directors: Dr Alex Scott-Samuel, Dr Martin Birley)
Tel: 0151 794 5570
Email: Impact@liv.ac.uk
Website:www.liv.ac.uk/~mhb/

HIA Research Unit University of Birmingham (Dr Jayne Parry and team)
Tel: 0121 414 3191, 0121 414 6024, 0121 414 7450
Email: J.M.PARRY.1@bham.ac.uk

References

1. World Health Organisation. *Health Impact Assessment: main concepts and suggested approach.* Gothenberg consensus paper. WHO Regional Office for Europe, December 1999. Available from URL: www.who.dk/hs/ECHP/index.htm (cited March 2001).
2. Department of Health. *Saving Lives: Our Healthier Nation.* London: The Stationery Office, 1999.
3. Birley M H, Boland A, Davies L, Edwards R T, Glanville H, Ison E, et al. *Health and environmental impact assessment: an integrated approach.* London: Earthscan-BMA, 1998.
4. Will S, Ardern K, Spencely M, & Watkins S. *A prospective health impact assessment of the proposed development of a second runway at Manchester International Airport.* Manchester: Manchester and Stockport Health Commissions, 1994.
5. Winters L, Scott-Samuel A. *Health impact assessment of the community safety projects - Huyton SRB area.* Observatory report series no. 38. Liverpool Public Health Observatory, 1997.
6. Fleeman N. *Health impact assessment of the Southport drug prevention initiative.* Observatory report series no. 39. Liverpool Public Health Observatory, 1997.
7. Broomfield D. *Health impact assessment of the King George V playing fields, Huyton SRB area.* Observatory report series no. 32. Liverpool Public Health Observatory, 1998.
8. Winters L. *Health impact assessment of the International Astronomy and Space Exploration Centre, Twelve Quays, Wirral.* Observatory report series no. 43. Liverpool Public Health Observatory, 1998.
9. Fleeman N. *Prospective health impact assessment of the Merseyside integrated transport strategy (MERITS).* Observatory report series no. 45. Liverpool Public Health Observatory, 1999.
10. Population Health Resource Branch. *Health Impact Assessment Toolkit: A Resource for Government Analysts.* Ministry of Health, Victoria, British Columbia, 1994.
11. Federation of Swedish County Councils. *Focusing on Health - How can the health impact of policy decisions be assessed?* Stockholm: FSCC, 1998.
12. Fehr, R. *Environmental Health Impact Assessment: Evaluation of a Ten-Step Model.* Epidemiology 10; 618-25, 1999.
13. Ewan C, Young A, Bryant E, Calvert E, Calvert D. *National framework for environmental and health impact assessment.* Canberra: National Health and Medical Research Council, Australian Government Publishing Service, 1994.

14. Ministry of Health, New Zealand: *A Guide to Health Impact Assessment,* May 1998.
15. Asian Development Bank. *Guidelines for Social Analysis of Development Projects: Operational Summary.* Manila, Philippines, June 1991.
16. World Bank. *Environmental Assessment Sourcebook Volume I: Policies, Procedures and Cross-Sectoral Issues.* Washington DC, 1991.
17. Scott-Samuel A, Birley M and Ardern K. *The Merseyside Guidelines for health impact assessment.* Merseyside Health Impact Assessment Steering Group, Liverpool Public Health Observatory, 1998.
18. Ward A and Jassat F. *Achieving Health Outcomes through Best Value: A Toolkit to Assess Health Impact - An approach to the identification and specification of anticipated effects on health and health determinants.* Kirklees Metropolitan Council, 1998.
19. British Medical Association. *Health & environmental impact assessment, an integrated approach.* London, England: Earthscan publications, 1998.
20. NHS Executive. *A Short Guide to Health Impact Assessment: Informing Healthy Decisions.* London: London Regional Office, NHS Executive. Available from URL: http://www.londonshealth.gov.uk or http://www.ohn.gov.uk (cited March 2001).
21. Scottish Needs Assessment Programme. *HIA of the City of Edinburgh Council's Urban Transport Strategy.* Scottish Needs Assessment Programme , May 2000.
22. Kemm J. *Developing health impact assessment in Wales.* Cardiff: Health Promotion Division, National Assembly for Wales, 1999. Available from URL: www.wales.gov.uk/poliinfo/healthhealthimpact/pdf/healthimp_e.pdf (Cited March 2001).
23. Hansell A and Aylin P. *Routine data and health impact assessment - a review of epidemiological studies of socio-economic influence on health and evaluation of outcome indicators derived from routine health data for health impact assessment.* Report to the Department of Health, March 2000.
24. www.doh.gov.uk/research/healthimpact.htm (cited March 2001).
25. Ison E and Griffiths S. *Rich pickings.* Health Services Journal, 13 July 2000.
26. Health Education Authority. *Health update, 2000. Environment and health: road transport.*
27. Health Education Authority. *Health update, 2000. Environment and health: housing.*
28. Health Education Authority. *Health update, 2000. Environment and health: air pollution.*

Northern & Yorkshire PHO
2 Griffiths House
University of Durham Stockton Campus
East Drive
Thornaby
STOCKTON ON TEES
TS17 6JZ
Phone: (01642) 385900
Email: pho.udsc@durham.ac.uk
Website: www.nypho.org.uk